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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/586,050	07/14/2006	Manabu Amikura	33082R337	2437
441	7590	07/20/2007		
SMITH, GAMBRELL & RUSSELL 1850 M STREET, N.W., SUITE 800 WASHINGTON, DC 20036			EXAMINER FORD, NATHAN K	
			ART UNIT 1709	PAPER NUMBER
			MAIL DATE 07/20/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/586,050

Applicant(s)

AMIKURA, MANABU

Examiner

Nathan K. Ford

Art Unit

1709

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 7/14/06, 10/5/06
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 5-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Kuwada et al., US 2002/0029748.

Kuwada teaches a showerhead disposed within a process chamber comprising the following:

- A showerhead with a cup-shaped main body (82) disposed on the ceiling of a cylindrical vessel (22) ([0049]; [0021]);
- A mount table (28) within the vessel (22);
- A plurality of holes (94) in the showerhead bottom wall;
- The showerhead has a sidewall (98);
- A diffusion plate (122) is disposed within the showerhead body ([0058]);
- The showerhead is fit into an opening (74) in the ceiling of the process chamber;
- The structures contiguous to and including the medium channel (116) compose the cooling mechanism [0056]
 - The mechanism includes a Peltier element (112)
 - The cooling jacket is the undesignated structure surrounding the channel (116)
 - The mechanism is exposed to an exterior of the vessel
 - The mechanism is attached to an upper end portion of the showerhead side wall (98)
- The ceiling functions as head mounting frame
 - The through hole accommodates the showerhead flange (104); elements 106b and 84 define the perimeter of the through hole in the sectional view of Figure 2;
- Figure 10 delineates screw bolts extending through the showerhead and connected to the head mounting frame ([0011]).

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Claim 6 differs from claim 1 only in its recitation of the showerhead's "attachment," rather than "insertion," to the mounting frame such that the showerhead sidewall is exposed to an exterior of the processing vessel. Kuwada teaches such an embodiment, delineated by Figure 1. The showerhead flange (104) is clearly exposed to an exterior of the processing vessel.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwada in view of Hytros et al., US 2003/0132319.

Kuwada teaches neither the hinge fixing of the head-mounting frame to the chamber wall nor the capacity to remove the frame from the wall. Hytros teaches a showerhead assembly within a process chamber wherein the ceiling lid (144) is coupled to the chamber walls (106) via a hinge; the hinge allows the lid to be opened, thereby exposing the interior of the chamber body ([0028]). Given that the connecting piece is a hinge, the lid can most certainly be removed from the chamber. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to affix Kuwada's mounting frame to the chamber wall with a hinge as disclosed by Hytros to expose the interior of the chamber body.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwada et al., US 2002/0029748, in view of Metzner et al., US 2002/0192370.

Kuwada does not teach a plurality of through-holes in the head-mounting frame. Metzner, disclosing a deposition reactor, teaches a showerhead (240) inserted into multiple through-holes via fasteners (242) formed in a head-mounting frame (205); the fasteners, and thus the through-holes, are arranged at annular intervals in a circumferential direction (Figs. 4-5; [0054]). Metzner conceived the said fastener arrangement to increase contact between the head-mounting frame and the showerhead, which in turn begets greater heat transfer. Accordingly, it

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would have been obvious to one of ordinary skill in the art at the time the invention was made for Kuwada to adopt the connectivity between the showerhead and head-mounting frame disclosed by Metzner to beget greater heat transfer.

Claims 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwada et al., US 2002/0029748, in view of Fujikawa et al., US 5,595,606.


Kuwada teaches one diffusion plate disposed within the head body to disperse the gas toward the wafer surface; he does not teach a plurality of plates ([0012]). Fujikawa teaches an embodiment wherein a plurality of diffusion plates (14) are stacked in layers within the showerhead body (Fig. 15). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add one diffusion plate to the head body of Kuwada as taught by Fujikawa to further enhance the dispersion of gas toward the wafer surface.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan K. Ford whose telephone number is 571-270-1880. The examiner can normally be reached on M-F, 8:30-5:00 EDT. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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JENNA BEFUMO
PRIMARY EXAMINER